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Batch-37

General Science and Ability

Section - II

Question-7

Part-a

Given

Father's age = $y = 4x$

$y + 5 = 3x$ ——— (1)

$y + 10 = n(x + 10)$

To find = 'n'

Solution

as $y = 4x$ —— putting in equation (1 we get

$4x + 5 = 3x$

$4x - 3x = -5$

$x = -5$ (−) ignored as age cannot be in (−)

$\therefore x = 5$

from equation (1) finding y now

$y = 3(5) - 5$ or $y = 4x$

$y = 15 - 5$ $y = -20$ $y = 4(5) = 20$

After 10 years

$y = 20 + 10 = 30$

$x = 15$

$\therefore n = \frac{30}{15} 2$

$\therefore n = 2$

Answer

After 15 more years (10 years) father will be 2 times of this daughter's age.

(Part-c)

I.Q : Intelligence quotient

"measures intelligence in form of mathematic value"

It tells about intelligence of a person

EQ : Emotional Intelligence

"measures emotional capacity or intelligence in form of mathemical value"

It mostly revolves about self recognition or evaluation.

Median:

Exact middle value of a series of number

Sometimes it is average of 2 middle most values.

e.g $1, 2, 3, 4, 5, 6$

$\frac{3+4}{2} = \frac{7}{2} = 3.5$ — median

or $1, 2, 3, 4, 5$

median = 3

Mode

Most frequent value of series.

e.g 1, 2, 3, 4, 3, 9, 3, 6, 3, 4

∴ mode = 3

Range

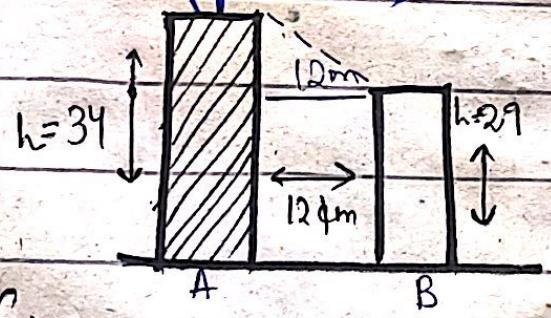
It is the difference between highest and lowest value of arithematic series

1, 2, 3, 4, 5, 6, 7

7 - 1 = 6

∴ range = 6

(Part-d)



Given

distance between buildings = 12m

As the buildings are vertically positioned, the distance between their roof will be same as ~~that~~ the distance between ~~them~~ ~~thier~~ their upper edges will be same i.e 12m that can be made base

∴ Base = 12m

To find out perpendicular,

h of building A = 34

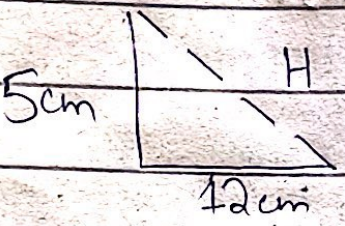
h of building B = 29

∴ 34 − 29 = 5

∴ Perpendicular = 5

Now hypotenuous will tell the actual difference between their roofs

Using pathygoras theorem



$(H)^2 = (P)^2 + (B)^2$

$(H)^2 = (5)^2 + (12)^2$

$(H)^2 = 25 + 144$

$(H)^2 = 169$

Applying $(\sqrt{\ })$ on both sides

$\sqrt{(H)^2} = \sqrt{(13)^2}$

∴ H = 13

Answer

Distance between roofs of both buildings is 13cm

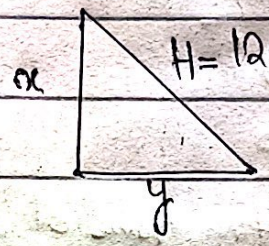
(Part-b)

Given:

Shape: Isoceles Right Triangle

(Hypotenus)^2 = 128 cm^2

To find: length of each side



Calculations:

As it is Isoceles Right Triangle Pythagoras Theorem can be applied

$(\text{Hypotenus})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

$128 = (\text{Base})^2 + (\text{Perpendicular})^2$

lets say base = papendicular = X

$128 = 2X^2$

$X^2 = 128/2$

$X^2 = 64$

$\sqrt{(X)^2} = \sqrt{(8)^2} \quad \therefore X = 8$

Hence base = 8cm

perpendicular = 8cm

Question : 08

Part - (a)

$$N = \frac{n(n+1)}{2}$$

$$N = \frac{9(9+1)}{2}$$

$$N = \frac{9(10)}{2}$$

$$N = 45$$

Hence 45 squares are present in given diggram.

Part - (b)

Arithmatic mean = 17

number of observation = 14

$x = ?$

$$\text{Mean} = \frac{\text{Sum}}{\text{No.}}$$

$$\text{Sum} = 238$$

Without x

$$\text{um} = 26+12+14+15+17+9+11+18+16+28+20+22+8$$

$$= 216$$

$$x = 238 - 216$$

$$x = 22$$

Therefore, missing number is 22.

(Part - c)

Solution

$4x + 6y = 260$ — (1)

$2x + 4y = 160$ — (2)

Multiplying eq (2) with -2

$4x + 6y = 260$ — (1)

$-4x - 8y = -320$

$-2y = -60$

$y = 30$

Also for x, putting value of y in eq (1)

$4x + 6(30) = 260$

$4x + 180 = 260$

$4x = 260 - 180$

$4x = 80$

$x = 20$

$\therefore x = 20 \quad y = 30$

Answer

Hence, we require 20kg sugar and 30kg flour.

(Part-d)

1st 4 prime Number = {2, 3, 5, 7}

1st 10 Natural Number = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

A = {2, 3, 5, 7}

B = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Complement(A') = {1, 4, 6, 9, 10}

Part-II

(Section-II)

(Question :02)

(Part-a)

Cyclone

System of rotating winds due to pressure gradient and ~~Coriollous~~ Coriolis effect of spin motion of earth

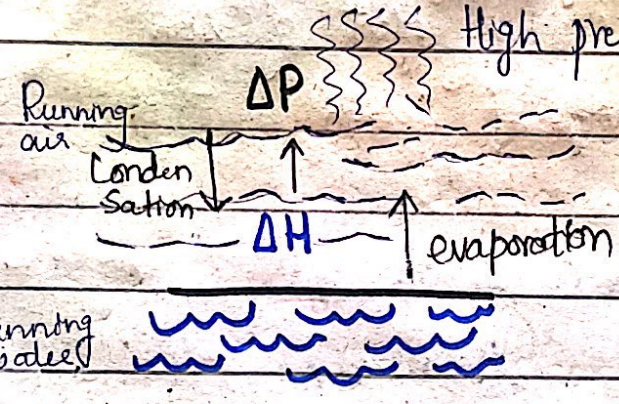
Causes of Cyclone

a) Pressure gradent

It refers to change in pressure ΔP = from high pressure to low pressure.

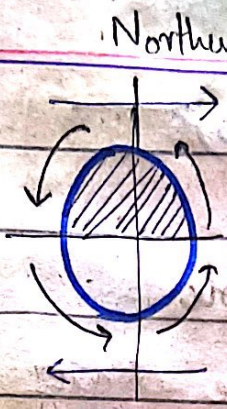
- Water evaporates from surface of water change of state occurs that is from ~~so~~ liquid to gas.

- On the other hand condensation takes place i.e from gas to liquid which releases ΔH (Heat of condensation)
- Hot air rises (pressure) and ~~ΔH~~ ΔP is observed that is from low to high.
- Pressure above water ~~two~~ body rises in air



b) Carollis effect

- It is the force that moves northern hemisphere of earth to right and southern hemisphere to the north due to spin motion of earth
- When centripetal force originates object in moving frame moves in spin motion fastly
- Centrifugal force originates as the result of centripetal force.



Coupling of carollis Coriolus effect with pressure gradient generates cyclone.

Carolis effect + Pressure gradient → Cyclone.

Most destructive part of Cyclone

Core or middle most part of cyclone is most destructive and strong one due to highest ~~densite~~ pressure and heaviest rainfalls.

(Part-b)

Black hole

An object of extreme density and strong gravitational pull. It has such strong gravitational pull that even light cannot escape it.

Einstein concept

Black hole have very strong gravitational pull due to maximum density It ~~gives~~ shows maximum capturing due to strong holding Eemstein related density & with gravity as :-

Density ∝ Gravity

more density = more gravity

less density = less gravity.

That is the reason behind very strong gravitational pull of Black hole.

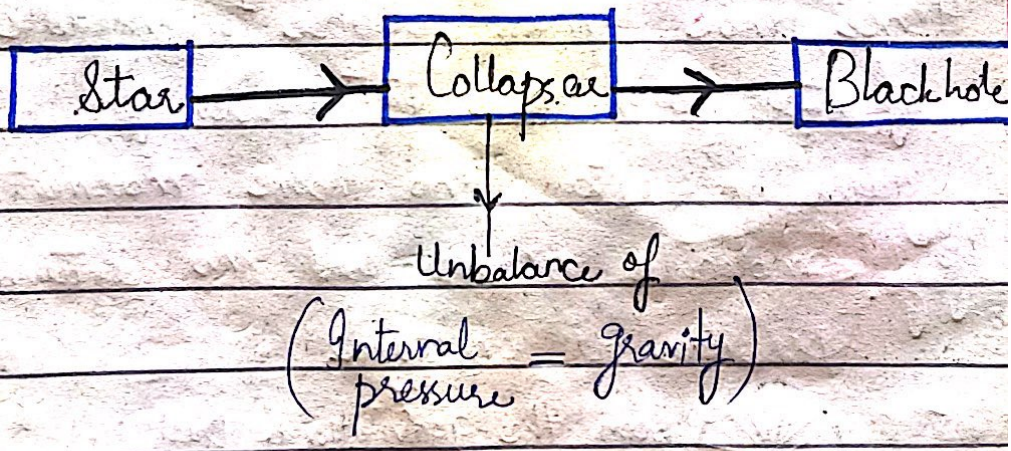
Formation of black holes

The phenomenon of black hole formation is refered as "Collapsar"

Collapsar is process of collapse of star. When star collapse and more material accumulates in the centre of star i.e more density mass on less volume referring to high density.

Einstein concept : Density ∝ Gravity

Due to increased density the gravitational pull of object also increase and certainly the star becomes a black hole.



∴ Interval pressure ≠ gravity → Collapsar

Chemistry behind collapsar

Star are objects formed of different gases and continuously under two equal and opposite forces i.e

a. Internal pressure

b. Gravity

internal pressure.

gravity

Whenever the imbalance between these two occurs, star collapses for instance, star

less internal pressure.

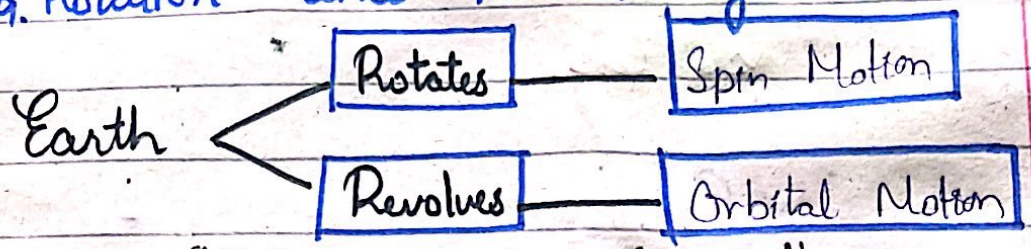
more gravity

Hence, more mass collapse to middle of star and due to defusion of gases in star no more movement of molecules occurs and no internal pressure is observed.

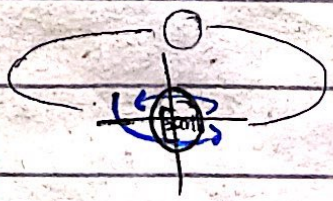
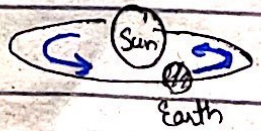
Soon the gravitational pull accumulates more mass in less volume and object with very stong gravity forms called black hole

(Part-C)

9. Rotation and Revolution of Earth



"Both are motion of earth"

Rotation	Revolution
It is also called Spining motion of earth	It is known as orbital motion of earth
It refers to circular movement of earth around its axis	It refers to circular motion of earth around Sun along its orbit.
Rotation Completes in 24 hours.	Revolution Completes in 365 days.
It is responsible for changes in day and night	It is responsible for seasonal changes.
	

b. Structural parts of earth

a. Crust
b. Mantle
c. Core.

a. Crust

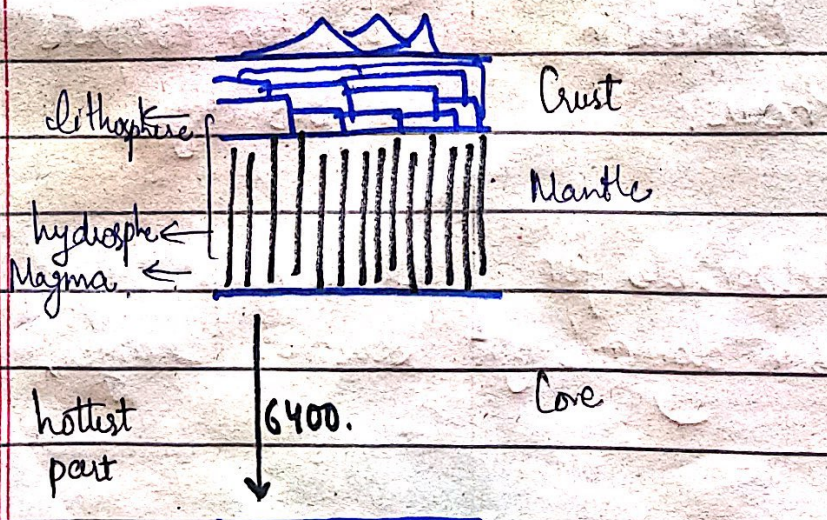
It is upper most structual part of earth and consists of rocks and silicates its depth is 70km

b. Mantle

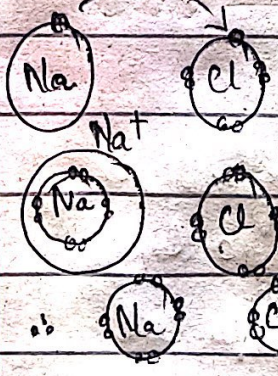
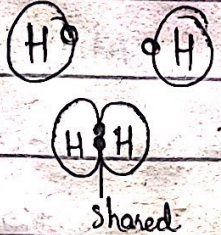
It contains silicates but at high pressure. Its depth is 2900km

c. Core

It is inner most part of earth and contains metals its depth is 6400km



(part-d)

	Ionic Bond	Covalent Bond.
Definition	It is the chemical bond formed by complete transfer of valence election from one atom to another.	It is the chemical bond formed by mutual sharing of valence election between 2 atoms.
Atoms	forms between metals	forms between non-metals
Representation	Represented by dot and cross diagram Na:Cl	Represented by dash between atoms C-C N≡N O=O
Strength	Strongest chemical bond	Relatively weaker than ionic bond.
	Example;	Example;
Diagram	 ∴	 ∴ H-H

Question : 03

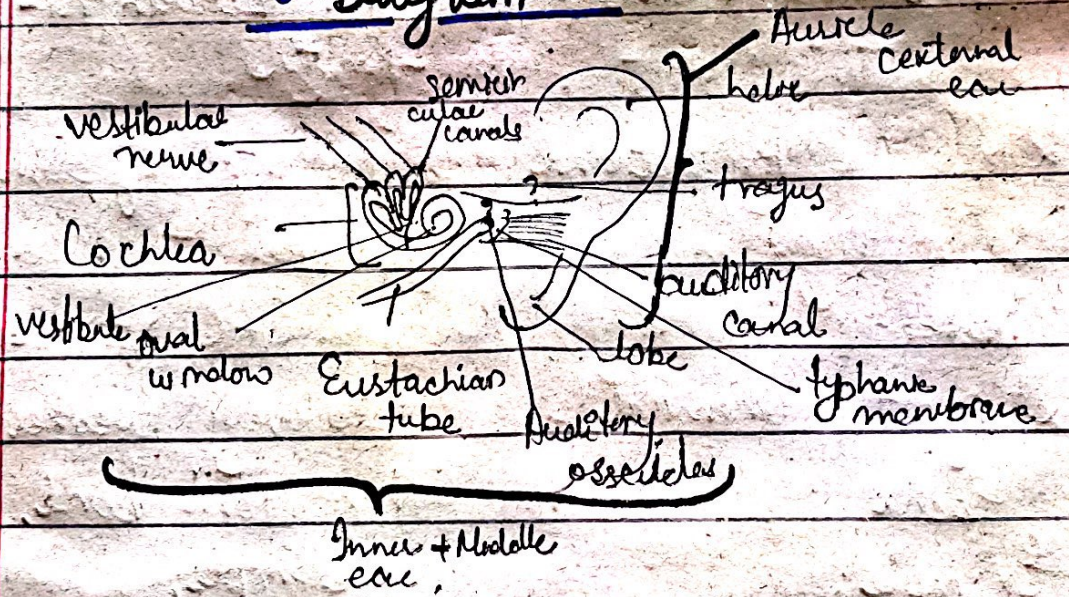
(Part - a)

Structure of Ear

• Human Ear

Ear is organ specialized for hearing or sound recognition. It is one of the most vital element of human body as it is specalized for one of 6 senses of human.

• Diagram



(Part - b)

Mitochondria

Mitochondria is a cellular organelle. It is present in plants and animals and provides chemical energy to cell. It is commonly known as power house of cell.

"Mitochondria chondria is power house of cell"

Power house : Provides energy / power

Mitochondria : Provides chemical energy

Therefore Mitochondria can be synonymous to power house in context of cellular biology

How it provides energy

 → ATP → cell functioning.

Mitochondria carry out multiple functions that release energy in the form of ATP

ATP ← Oxidative Phosphorylation

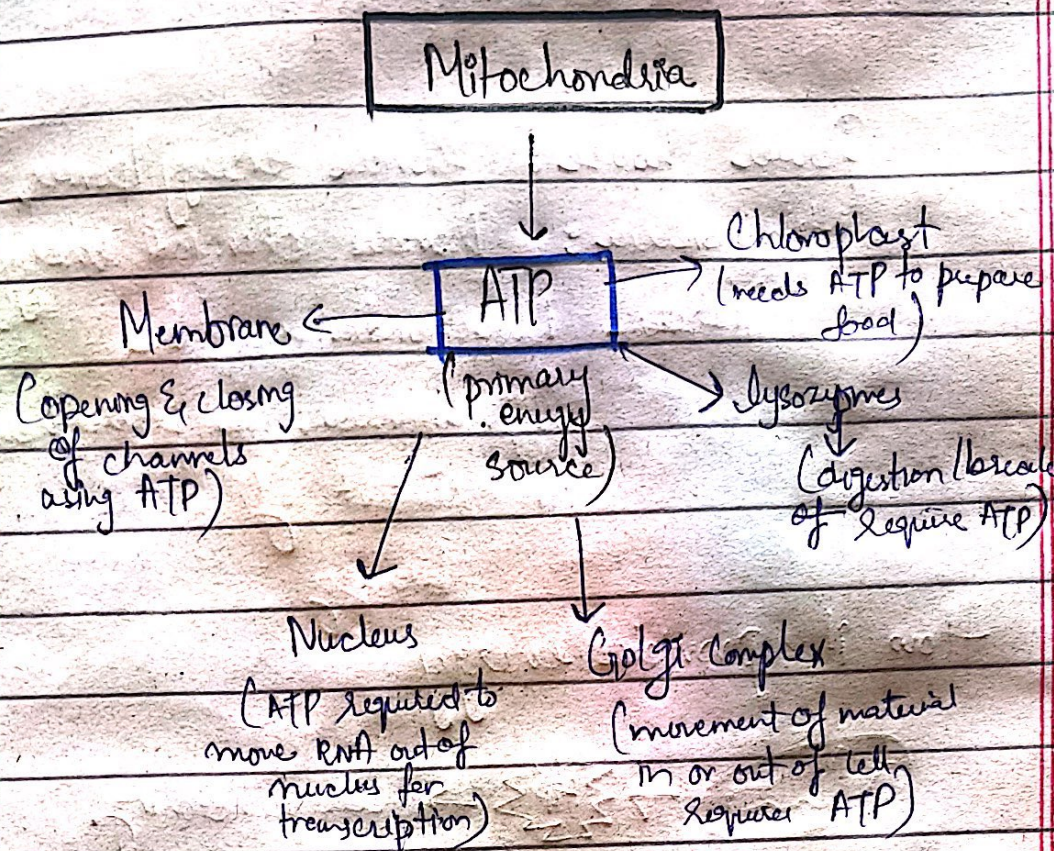
↓

ATP ← Glycolysis

↓

ATP ← ~~Per~~ Aerobic Respiration

These ATP molecules goes to different part of cells to carry out their relative functions that are necessary for cell survival



That's why mitochondria is known as power house of cell

—(Part-d)—

"Food adultration can be cause food detrioration"

Food adulteration refers to mixing the foreign substance in food that changes taste, color or quality of food.

No doubt, it can lead to food deterioration As beside multiple ~~reasons~~ indicators of food

deterioration one is change in color and taste.

Therefore, food adulteration is also a cause of food deterioration, thats why adulterated food results in health impacts like diarrhea and food poisoning.

Remidial measures to curb food adulteration in Pakistan

1) Strict food evaluation

Eva Effective evaluation of most adulterated food like beef and milk should be observed

2) Regular rounds

Regular rounds of food department authorities should be ensured with effective evaluation

3) Inspection teams

Inspection teams should be placed in food commercial areas to keep check and balance on food material imports in markets

4) Appropriate price diction

One of reason behind food adulteration is high prices and low demand. Government must dictate reasonable food prices,